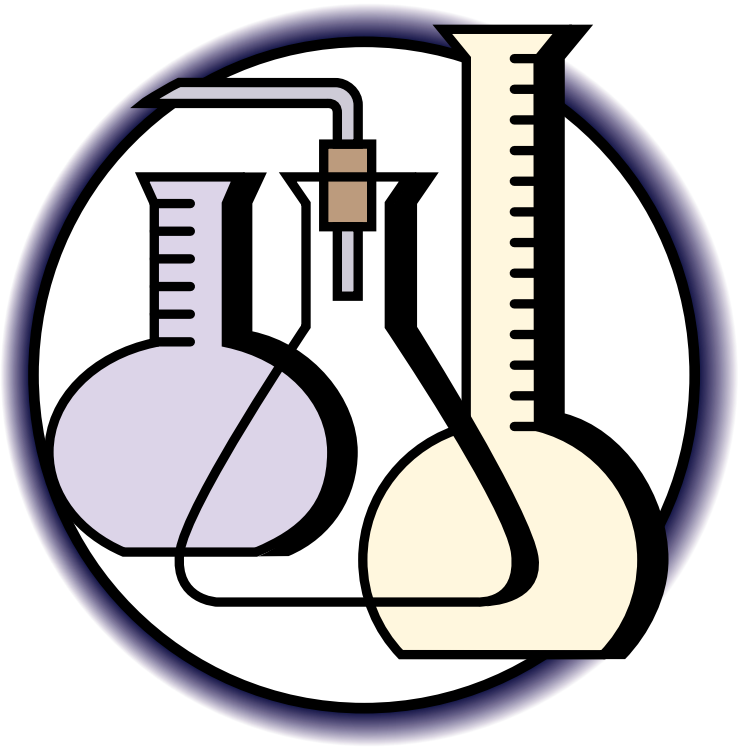
Michigan Educational Assessment Program

Released Items

from the

HST in Science Assessment



Michigan Educational Assessment Program
January 2000

DIRECTIONS

In this test you will demonstrate your understanding of science. You will take the entire test in one session, and you will have at least 2 hours to complete this test.

Use only a No. 2 pencil to mark your answers. Make a dark mark that fills the oval completely. If you change an answer, be sure to erase the first mark completely.

Make sure you read each question carefully. You may write in your test booklet, however, you must record answers to all questions in your **answer document**.

There are two types of questions in this test, multiple choice and constructed response (open-ended). For the multiple-choice questions, mark the letters for the answers you select in the appropriate ovals in your answer document. For each multiple choice question, choose the **BEST** answer. If you skip a question, be sure to skip the number in your answer document that corresponds to that question. Remember, mark only one answer for each numbered question. Make sure the number of the question corresponds to the number in the answer document.

For the constructed-response questions, write complete and thorough answers in the **answer document** in the spaces provided for each individual item.

If you do not understand any of these directions, please raise your hand.

SAMPLE ITEMS

Sample 1 Below is a data table which shows the melting and boiling points of common substances. Study the table.

Substance	Melting Point (°C)	Boiling Point (°C)
Water	0	100
Alcohol	–117	78
Nitrogen	–210	–196
Oxygen	–218	–183

Which substance should be a *liquid* at –90 degrees?

A water
√ **B** alcohol
C nitrogen
D oxygen

(2 points)

Sample 2 As water boils, the arrangement and behavior of the water molecules undergo changes. Describe at least two of these changes on the lines provided in your answer document.

ANSWER THIS ITEM IN YOUR ANSWER DOCUMENT.
NOTHING WRITTEN IN THE SPACE BELOW WILL BE SCORED.

1 If you wanted to observe the stages of cell division, you would need a

A computer.

B television.

C microscope.

D magnifying glass.

2 Under what conditions will a substance be likely to enter a cell through diffusion?

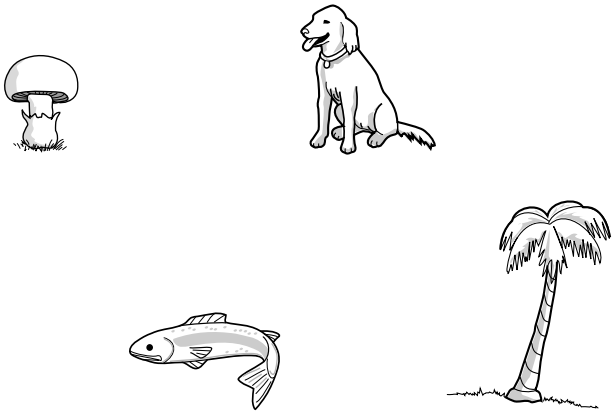
A when the substance is a particle of food

B when a molecule of the substance is very large

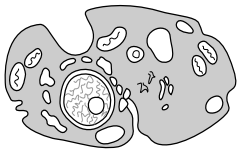
C when the concentration of the substance is greater outside the cell than inside

D when the concentration of the substance is greater inside the cell than outside

3



Study the five organisms shown above. Which of the organisms have cells similar to the cell shown below?



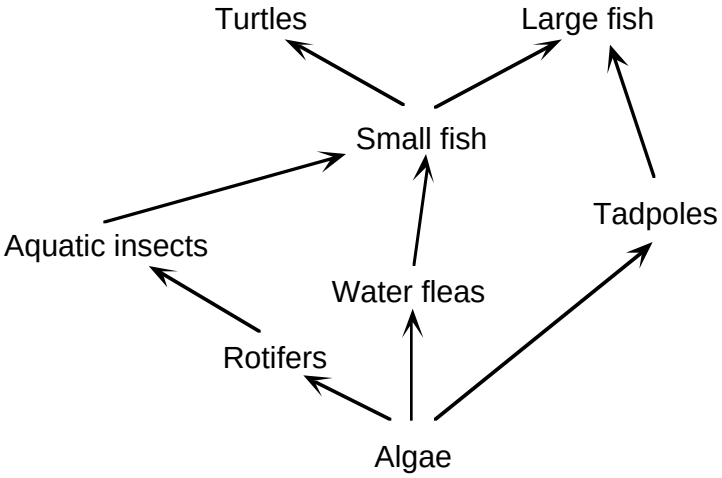
A the mushroom and the dog

B the fern and the palm tree

C the dog and the fish

D the fern and the fish

The diagram shows part of an aquatic food web for a stable lake ecosystem in Michigan. Study the food web. Then answer questions 4 through 5.



4 What is the source of energy for the algae?

A waves

B sunlight

C bacteria

D rotifers, water fleas, and tadpoles

(2 points)

5 A company wants to build a factory to produce weed killer. The new factory will be located close to the lake ecosystem with the food web shown in the diagram above. What would happen if weed killer from the factory were to pollute the lake? In your response, be sure to include two ways the aquatic food chain could be affected.

ANSWER THIS ITEM IN YOUR ANSWER DOCUMENT.
NOTHING WRITTEN IN THE SPACE BELOW WILL BE SCORED.

Read the following investigation carefully. Then answer questions 6 and 7.

INVESTIGATION

Problem — Three students decided to conduct an investigation to determine how well different materials block the operation of remote controls for television sets.

Hypothesis — Aluminum foil blocks remote signals best.

Materials
3 television remote controls
3 televisions
Sheets of paper
Sheets of aluminum foil
Sheets of plastic wrap

Procedure
1. Student A went home and placed a sheet of paper between the remote control and the television, and then tried to turn on the television using the remote control. This procedure was repeated several times, each time adding another sheet of paper between the remote control and the television. The procedure was continued until the remote control was no longer able to turn on the television.
2. Student B went home and followed the same procedure as Student A, using plastic wrap rather than paper.
3. Student C went home and followed the same procedure as Students A and B, using aluminum foil rather than plastic wrap or paper.
4. Each student recorded the number of sheets of material required to block the signal.

Results

Student	Material	No. of sheets needed to block signal
A	paper	14
B	plastic wrap	25
C	aluminum foil	6

Conclusion — Aluminum foil is more effective than paper or plastic wrap in blocking remote control signals.

(2 points)

6 Identify three weaknesses in the procedure used for this investigation.

ANSWER THIS ITEM IN YOUR ANSWER DOCUMENT.
NOTHING WRITTEN IN THE SPACE BELOW WILL BE SCORED.

(2 points)

7 Describe how you would correct each of the three weaknesses you identified.

ANSWER THIS ITEM IN YOUR ANSWER DOCUMENT.
NOTHING WRITTEN IN THE SPACE BELOW WILL BE SCORED.

8 Study the table below. Which atom has a net positive charge?

Atom	Number of Protons	Number of Neutrons	Number of Electrons
W	3	4	3
X	53	57	53
Y	55	60	54
Z	1	0	1

A Atom W

B Atom X

C Atom Y

D Atom Z

9 Which of the following choices best explains why grass on a distant hillside appears green?

A Grass reflects all colors except green.

B Grass absorbs only green light from the sun.

C Grass reflects green light more than any other color.

D Grass transmits green light in the same way that green-colored cellophane does.

10 Which of these is a benefit of using nuclear energy?

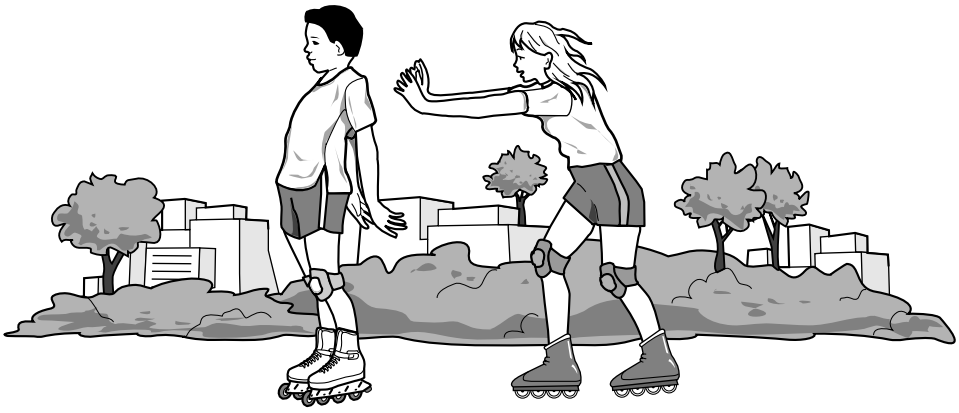
A Nuclear by-products are useful for further energy production.

B Nuclear fuel supplies are extremely abundant on Earth.

C Nuclear power is much less expensive to produce than other energy sources.

D Nuclear power plants normally release fewer pollutants into the air than the combustion of coal and oil.

11 Christina and Juan are standing still on their roller blades. What happens when Christina pushes Juan from behind?



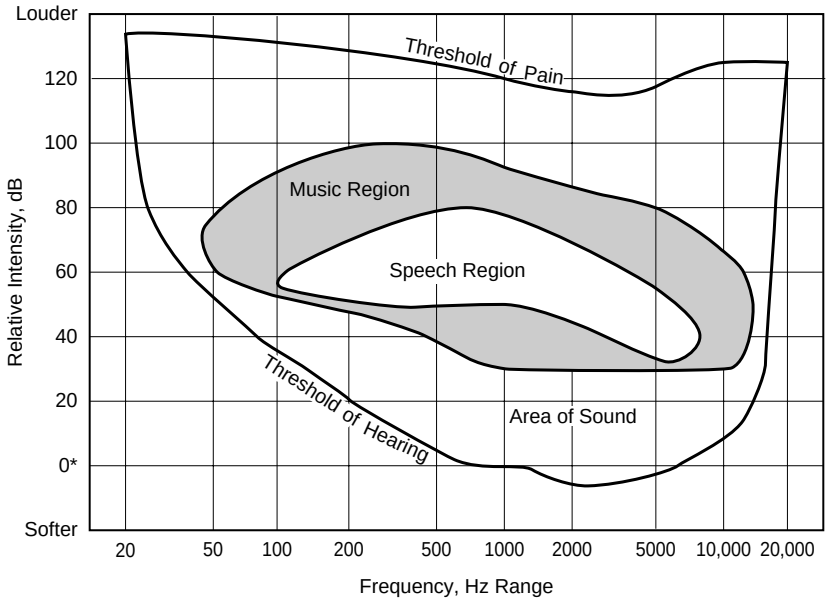
A They both travel forward.

B They move closer to each other.

C She moves backward and he moves forward.

D He moves forward and she remains where she is.

12



* 0 dB represents the softest sounds that the average person can hear. Some people can hear even softer sounds.

According to the graph above, the threshold of pain caused by sounds depends on

A the frequency alone.

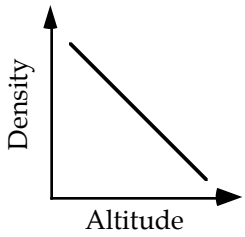
B the loudness alone.

C both the frequency and the loudness.

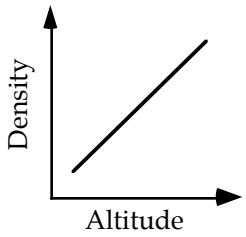
D neither the frequency nor the loudness.

13 As altitude increases, the density of the air around the balloon decreases. Which graph below shows this relationship?

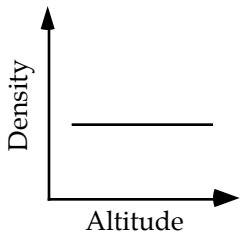
A



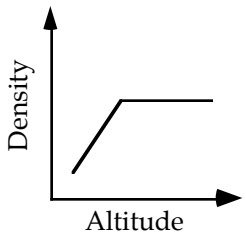
B



C



D



(2 points)

14 How does the temperature of the air inside the balloon affect the load that can be lifted by the balloon? In your response, be sure to include the concept of density.

ANSWER THIS ITEM IN YOUR ANSWER DOCUMENT.
NOTHING WRITTEN IN THE SPACE BELOW WILL BE SCORED.

Read the following article carefully. Then answer questions 15 and 16.

SPONGES KILL ZEBRA MUSSELS

Researchers say freshwater sponges may be the remedy for menacing zebra mussels in Lake Michigan.

"What appears to be happening is the lake itself is starting to do something about the mussel population," said Tim Early, executive director of the Aquatic Research Center.

Zebra mussels were discovered in the Chicago area in 1989 and have been multiplying rapidly since then. The mussels clog factory and water plant intakes, and have encrusted boat hulls and appeared on beaches. "Until now there hasn't been a way to control the mussel population without also hurting the surrounding environment," Early said.

It's now confirmed that freshwater sponges, or spongilla, compete with mussels for food. They kill the mussels by attaching themselves over the fingernail-sized mollusks, cutting off the mussels' food and water supply.

Controlled use of spongilla will not present a danger to other aquatic life, and the sponges cannot clog water inlets the way the mussels have. "Spongilla are native to Lake Michigan; they don't cause any damage," Early said. "They've been there for thousands of years."

Zebra mussels may actually be responsible for helping the sponges thrive. In 1991 the lake was home to an average of about two to three sponge colonies per square meter. By 1993 the sponge population had increased to 10 to 15 colonies per square meter. The mussels made the lake clean enough for the sponges by acting as natural water filters, with each tiny mussel filtering about one quart of water each day.

Early said the mussels' cleaning power is noticeable even to visitors.

(2 points)

15 Freshwater sponges will control the zebra mussel population in the waters of Lake Michigan.

Based on information given in the article, would you say the above statement is a *fact* or an *opinion*? In your response, be sure to include at least one explanation that supports your answer.

ANSWER THIS ITEM IN YOUR ANSWER DOCUMENT.
NOTHING WRITTEN IN THE SPACE BELOW WILL BE SCORED.

(2 points)

16 "The mussels made the lake clean enough for the sponges by acting as natural water filters . . ."

The article implies that zebra mussels are reponsible for making Lake Michigan habitable for freshwater sponges by filtering and purifying the water.

- In the article, what evidence is offered to support this view?
- Evaluate the strength of this evidence.

ANSWER THIS ITEM IN YOUR ANSWER DOCUMENT.
NOTHING WRITTEN IN THE SPACE BELOW WILL BE SCORED.

17 Rain and thunderstorms are most often associated with

A breezes that move from the sea toward the land.

B breezes that move from the land toward the sea.

C the collision of a warm, moist air mass with a cold, dry air mass.

D the collision of a cold, moist air mass with a warm, dry air mass.

18 During Earth's history, changes in climate have caused

A periods of glaciation.

B shifting of tectonic plates.

C shifting of Earth's magnetic poles.

D periods of increased volcanic activity.

19 The **MAIN** source of energy for wind currents on Earth is

A lightning.

B heat from the sun.

C the moon's gravity.

D heat from Earth's interior.

20 In a vacuum, light travels at a speed of

A 300 km (186 miles) per minute.

B 300 km (186 miles) per second.

C 300,000 km (186,000 miles) per minute.

D 300,000 km (186,000 miles) per second.

21 After an oil spill on one of the Great Lakes, several hundred water birds were coated with oil. To prepare for an experiment, a wildlife biologist has gathered several different brands of detergent known to remove oil from birds. Which of these questions is the scientist probably planning to investigate?

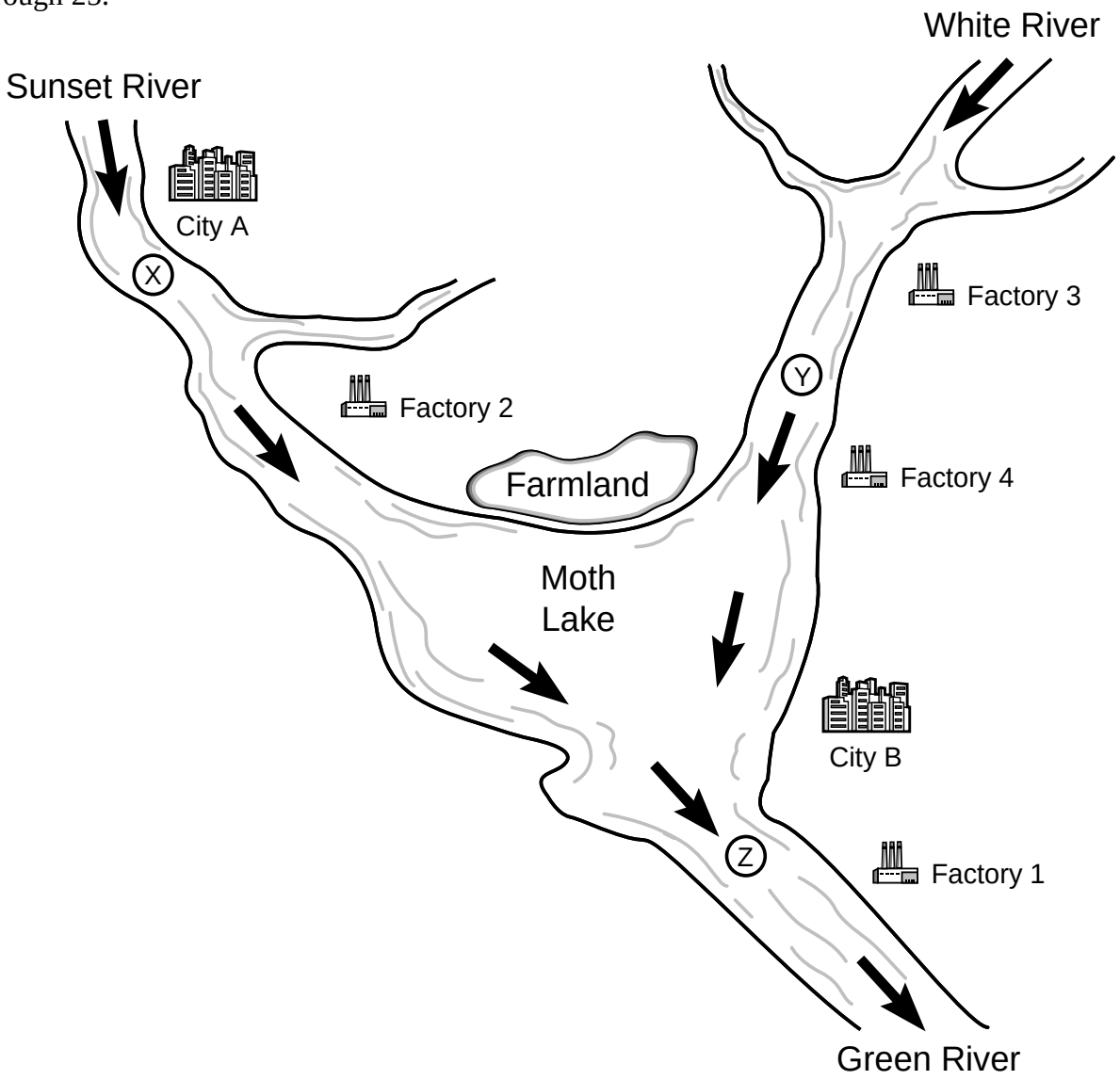
A Which species of bird is best cleaned by detergents?

B Which brand of detergent is best for producing suds?

C Which brand of detergent is best for removing oil from birds?

D Which species of bird is allergic to detergents?

The map shows the main streams and rivers near City A and City B, as well as the nearby factories and farmland. The arrows in the diagram show the direction of water flow. City A gets its water from the Sunset River and City B gets its water from the Moth Lake. Also shown are locations X, Y, and Z, where river-water samples are collected. Study the map. Then answer questions 22 through 25.



22 You live in City B and your water source is the nearby lake. Which of the following would have the **LEAST** impact on the quality of your water source?

A use of motorboats on the lake

B dumping of industrial wastes into the river at Factory 3

C poor sewage treatment by City A

D dumping of industrial wastes into the river at Factory 1

23 An herbicide was applied to the farmland through irrigation. What is the greatest risk of using the herbicide?

A It will pollute the water source for City B.

B It will pollute the water source for City A.

C It will pollute the air of City B.

D It will pollute the air of City A.

24 Factory 2 produces fertilizer. The factory must dispose of an old supply of fertilizers. Residents of City B would be **LEAST** likely to support a plan to

A send the fertilizer to an incinerator to be burned.

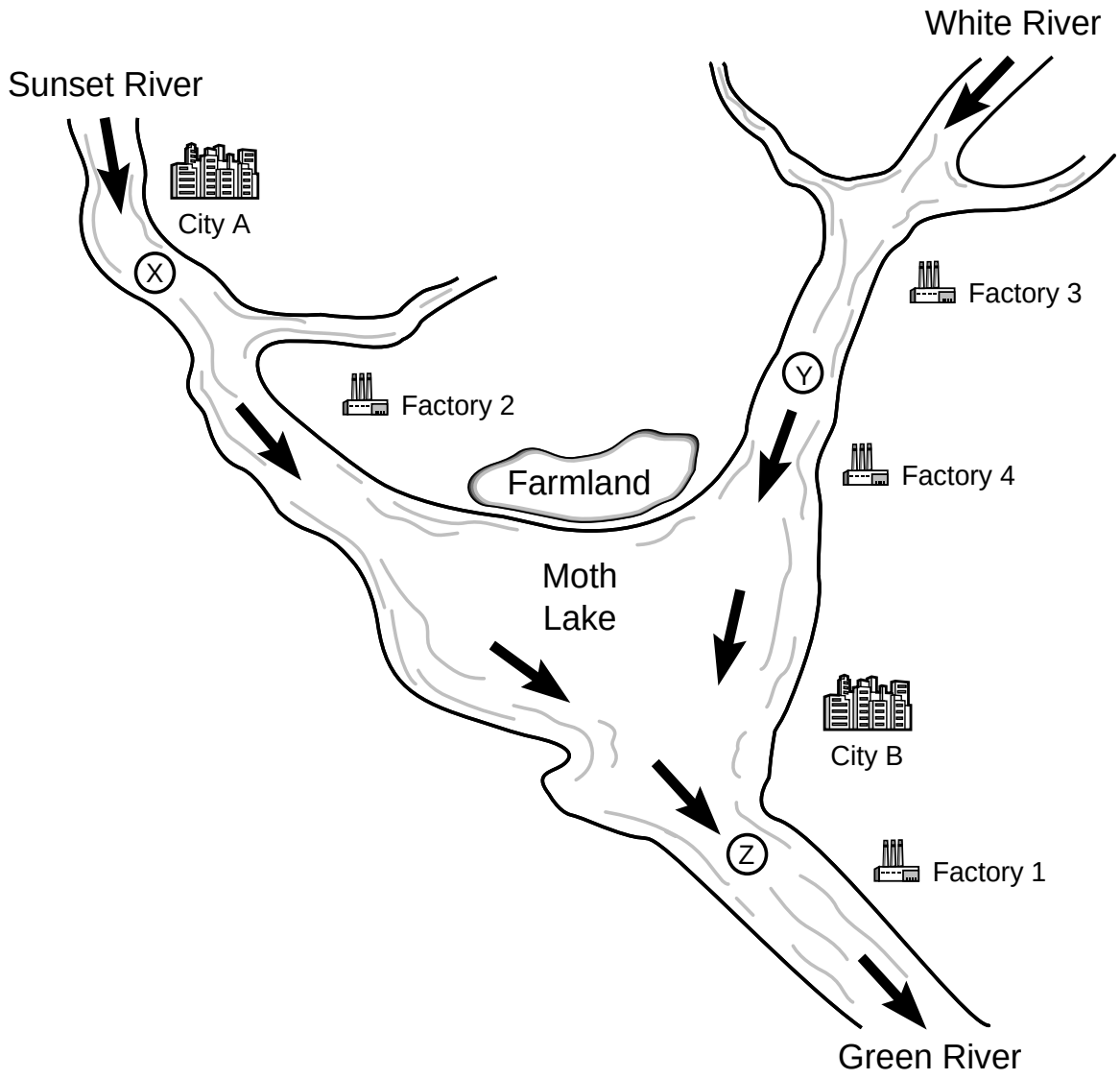
B dilute the fertilizer with water and release it into the river.

C send the fertilizer to a landfill to be buried.

D mix the fertilizer in concrete and use it to build roads.

(2 points)

25 Look at the map below. Water samples taken from location Z show high levels of pollutant K. Pollutant K may be produced by cities, farms, or factories. Pollutant K is not found in water samples taken at locations X and Y.



A. In the list in your **Answer Document**, circle possible sources of the particles of pollutant K detected at location Z.

B. Justify your selection of possible sources of pollutant K.

ANSWER THIS ITEM IN YOUR ANSWER DOCUMENT.
NOTHING WRITTEN IN THE SPACE BELOW WILL BE SCORED.

Selected Response Answer Key

1	C
2	C
3	C
4	B
5	Constructed Response
6	Constructed Response
7	Constructed Response
8	C
9	C
10	D
11	C
12	C
13	A
14	Constructed Response
15	Constructed Response
16	Constructed Response
17	C
18	A
19	B
20	D
21	C
22	D
23	A
24	B
25	Constructed Response

Question 5

KEY ELEMENTS:

- Weed killer will reduce/kill the algae population.
- Any statement suggesting that reduction of the algae population results in reduction of one/some/all levels of the food web/chain (no food source).
- Increased competition among consumers of algae may occur if algae population declines.
- Death of algae consumers may result in the increase of decomposers.

SCORE POINTS:

2 points = 2 key elements
1 point = 1 key element
0 points = other

2 points = The algae dies and then so does everything else.
or
Poisons the algae and kills animals that eat it.

1 point = Whole web wiped out.
or
They will all die.

Note: If the response doesn't connect weed killer and algae relationship (i.e. covers pollution in general), give credit if an understanding of the interconnections of the food web and removal of a food source from the web is present.

Question 5

If this weed killer were to pollute the lake it would mess up the whole food web. The weed killer would most likely kill the algae and therefore all the other organisms would strive. This would be so because if the algae died there would be nothing for the rotifiers, water fleas, and tadpoles to eat. If this happened than nothing else would be able to live. Another way this could change the web is that the weed killer may only kill the small fish. This means that the turtles would die out because there was nothing to eat, and the aquatic insects and water fleas would live in abundance because there is nothing living in the lake to devour them.

SCORE POINT: 2

This response describes several key elements, although only 2 are necessary for full credit. That the weed killer will likely kill the algae and thus provide nothing for the rotifers, water fleas, and tadpoles to eat is sufficient for 2 points. The remainder of the response also demonstrates a clear understanding of the inter-connections of the food web shown.

Question 5

The weed killer would kill the Algae, which kills the water fleas. And it would kill the Rotifers which kill the Aquatic insects. The effect it would have on the food web is there would be no small fish left.

SCORE POINT: 1

The 2 point rule (the algae dies & then so does everything else) does not apply to this high 1 response. It is not clear how the elimination of one member of the food web affects another.

Question 5

The weed killer would polute the the lake and that will have a big effect on the aquatic food chain.

SCORE POINT: 0

That the weed killer would pollute the lake restates the test item question. The effect of the pollution on the aquatic food chain is not defined.

Question 6

KEY ELEMENTS:

TV

- Students may have used different brands/kinds/types/sizes of tv.s
- Students should have used the same tv.
- Experiment should have been performed at one location (implies using one tv/remote).

REMOTES

- Students may have used different brands/kinds/types of remotes.
- One remote may be stronger/better/work differently than the others.
- Students may not have checked the range of the remote.
- Students may not have held the remote in the same position/may have held the remote at an angle/should have pointed the remote at the same spot.

BATTERIES

- The batteries in the remotes may have differed by brand/kind/type/quality/ strength.
- The students may not have checked the batteries.

DISTANCE

- Students/remotes may have been at varying distances from the tv.s.
- Materials may have been at varying distances from the tv.s/remotes.
- The disance/space between sheets of material may have varied.

MATERIALS

- Students did not standardize the brand/kind/size/thickness/composition of their sheets (foil,paper,plastic).
- Only one material was tested on each tv./each student should have tested all three materials.
- Students should have tested other/more/different materials.
- Something else may have blocked the signal (dirt,dust).

Question 6

OTHER

- Experiment should have been repeated/done more times.
- Investigation doesn't state whether or not experiment was repeated.
- Should have had more students perform the experiment.
- A control was needed (testing the tv/remote without a signal blocker).
- The hypothesis is too general/vague in stating aluminum foil blocks the signal "best" (and student explains the weakness of the hypothesis).

SCORE POINTS:

2 points = 3 key elements
1 point = 1-2 key elements
0 points = other

Question 6

One weakness would be that the students had different tv/remote controls. One students remote control might be more powerful than anothers. Also, they each only did one trial leaving no room for improvement & coming up with inaccurate data if an unknown mistake was made. Another problem was that they didn't record the distances from where the remote was compared to the t.v. or where the paper, aluminum foil, or plastic wrap was compared to the t.v.

SCORE POINT: 2

This response successfully identifies several weaknesses, of which at least 3 are valid.

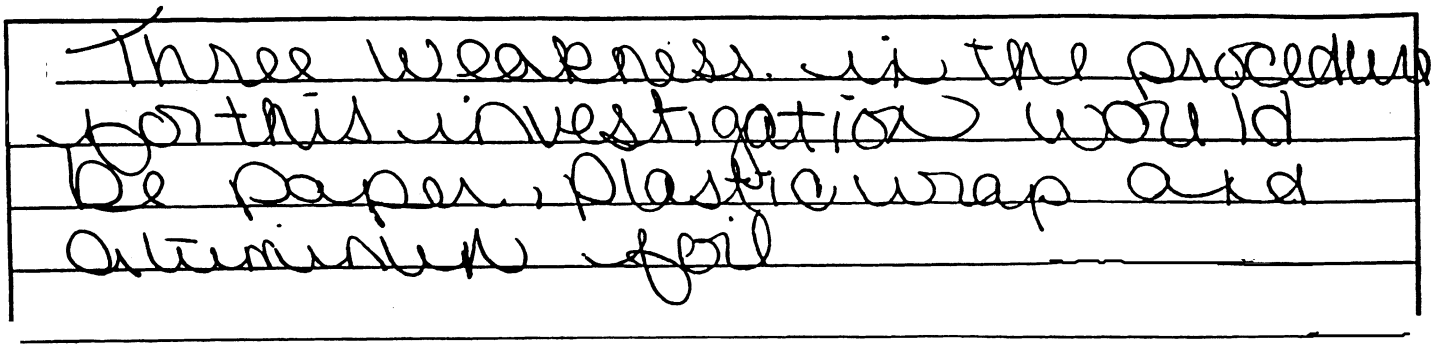
Question 6

The procedure ignores some of the other variables that could effect the outcome of the experiment. For example, the procedure says nothing about the batteries. One student could have weaker batteries in his remote than the other two, which would make the signal coming from his remote weaker. Also the procedure doesn't say anything about what distance the remote should be from the TV. Standing farther away from the TV could make the signal weaker than standing closer to the TV.

SCORE POINT: 1

Only 2 weaknesses are identified. Each is valid.

Question 6



SCORE POINT: 0

The 3 blocking materials are, in and of themselves, not weaknesses in the procedure.

Question 6

(Item 16 refers to item 7 in this document.
Item 15 refers to item 6 in this document.)

KEY ELEMENTS:

- Any valid correction of a weakness identified in item 15.

SCORE POINTS:

2 points = 3 valid corrections
1 point = 1-2 valid corrections
0 points = other

Note: Student can receive full credit in item 16 for correcting weaknesses identified in item 15 even if no/partial credit was received for 15.

Question 7

First off I would make sure I had 3 identical t.vs with the same amount of power in each control. Next, I would have each student do the experiment with all 3 materials instead of just one so we could compare & be more accurate. Lastly I would set all the remotes the same distance from the tvs with the material a specific distance inbetween. I feel these improvements will cause them to have a more accurate result.

SCORE POINT: 2

Valid corrections are given for each weakness, although only 3 are required to receive full credit.

Question 7

To correct these weaknesses in the procedure, I would make sure that it stated a constant for each variable. For example, it should state that all three remotes should have new batteries, and that each student should stand 10 feet away from the TV with the material 5 ft. from the T.V.

SCORE POINT: 1

This response logically corrects both weaknesses.

Question 7

If I were to correct them to help the T.V. Signal to work I would make the paper, plastic and Aluminum thinner.

... SCORE POINT: 0

Because the weaknesses in the response for item 15 do not address the thickness of the materials, making them thinner is not a valid correction.

Question 14

KEY ELEMENTS:

A: Density/Volume

- The heated air in the balloon is less dense than the surrounding air.
- Volume of air in the balloon increases as the air is heated.
- The mass of air displaced by the balloon must be greater or equal to the mass of the balloon in order for the balloon to be lifted or float.
- The mass of air inside the balloon decreases as cooler air is displaced out of the balloon.

B: Temperature/Bouyancy/Other

- The warmer the air inside the balloon, the greater the load that can be lifted.
- An increase in temperature of air inside the balloon will cause the balloon to rise.
- Balloon rises if gravitational force is less than the bouyant force.

SCORE POINTS:

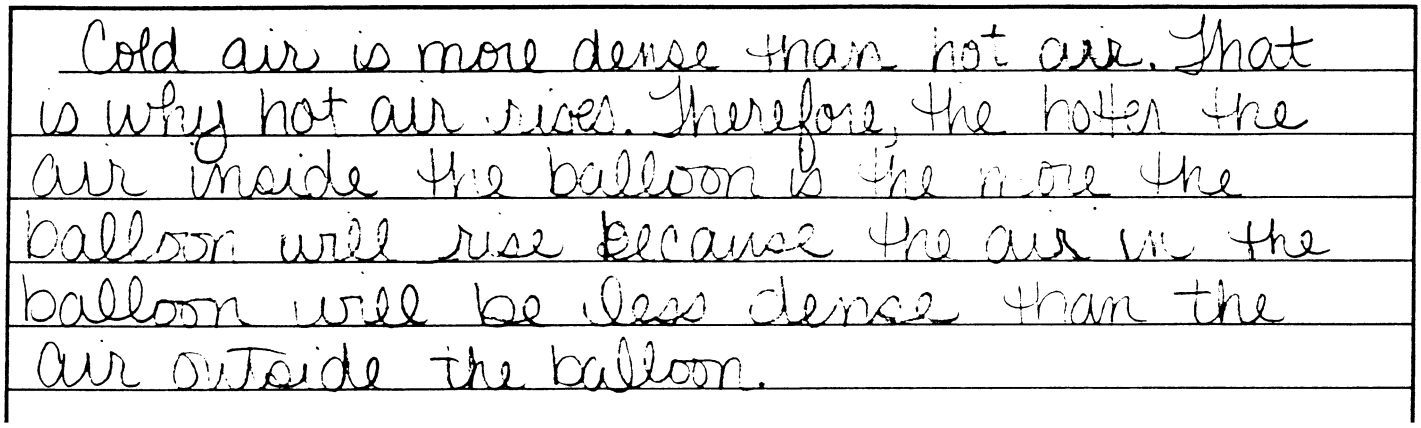
2 points = Both A and B are given correctly
1 point = Either A or B are given correctly
0 points = Other

mass = volume x density
density = mass / volume
volume = mass / density

This formula given with no explanation does not receive credit, however, an explanation of the formula in relation to the heat/load relationship may be eligible for all score points.

Note: For our purposes, weight is considered to be the same as mass.

Question 14



Score Point: 2

This response correctly addresses both key elements (A - cold air is more dense than hot air, B - the hotter the air inside...the more the balloon will rise).

Question 14

The temperature is what makes the balloon rise. That burner makes go up into the air.

Score Point: 1

This response receives credit for the heat/load relationship. The burner heats the air, so therefore the increase in temperature makes the balloon rise.

Question 14

I don't think it affects the load. Density is found by mass and volume. Temperature has no correlation whatsoever to the amount of people able to be lifted. All that matters is the volume of the air to the mass of the people and the density in the air.

Score Point: 0

This response is incorrect in its claim (temperature has no correlation whatsoever). The attempt to explain volume and density does not correctly address the key elements.

Question 15

KEY ELEMENTS:

A: Opinion
- Student claims that the statement is an opinion/hypothesis/false.

B: Explanation
- The article does not provide enough evidence concerning the impact of sponges on the zebra mussel population to call this claim a fact.
- Factors other than the size of the sponge population may play a significant role in regulating the size of the mussel population.
- The article states that sponges "may" be the remedy.
- Other valid evidence from the text to support the student's choice that the prompt statement is an opinion.

C: Fact
- Student claims that the statement is a fact/true and this claim is supported with valid evidence from the text.

Valid evidence to support the claim of "fact" includes"
- It's now confirmed that they compete for food.
- Sponges kill mussels.
- Sponges cut off mussels' food and water supply.
- Other valid evidence from the text to support the choice that the statement is a fact.

SCORE POINTS:

2 points = A and B
1 point = A (with no valid supporting evidence) or C
0 points = other

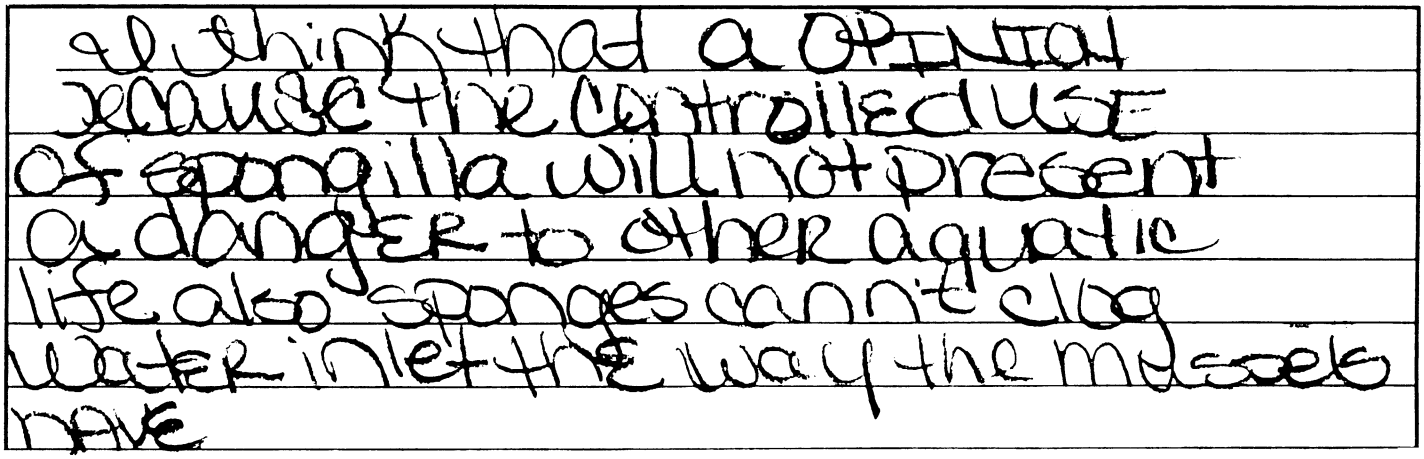
Question 15

I believe that the above statement is opinion. I believe this because while the supported a increase in sponge population, it did not indicate a decrease in zebra mussel population.

Score Point: 2

This response claims it is an opinion and supports this claim with valid evidence (the article did not indicate a decrease in zebra mussel population).

Question 15



Score Point: 1

This response claims it is an opinion, but the explanation given (sponges will not present a danger to other life, sponges can't clog water inlet) does not support the claim with valid evidence.

Question 15

This is a fact since sponges consume zebra mussel

Score Point: 0

This response claims it is a fact and does not support this claim with valid evidence (sponges do not consume zebra mussels, they compete with them for food).

Question 16

KEY ELEMENTS:

A: Evidence supporting the author's view

- Between 1991 and 1993, the sponge population has increased (from 2-3 colonies/square meter to 10-15 colonies/square meter).
- Each mussel filters a quart of water a day.
- The lake appears cleaner since the zebra mussel population has increased, as seen by visitors.
- Since 1989 the mussel population has been multiplying rapidly.
- Other valid evidence that supports the author's view.

Note: "Zebra mussels help the sponges thrive" is not valid on its own, but may be used in conjunction with other valid elements from the list above.

B: Evaluative statement with supporting evidence

- The evaluative statement must be supported with valid evidence from the text.
- Students may explicitly evaluate the evidence, the article, or the initial question. These are all acceptable approaches as long as the supporting evidence is valid.

Note: The student may also use prior knowledge of Lake Michigan, sponges, or mussels to support the evaluative statement, but this knowledge must be pertinent and correct.

SCORE POINTS:

2 points = A and B **OR** two elements from A
1 point = A or B
0 points = other

Question 16

The evidence is that in a span of two years the sponge colonies per square meter went from 2 to 3 in 1991 to 10 to 15 in 1993. This evidence, if collected properly does support the articles theory.

Score Point: 2

This response gives one valid piece of supporting evidence (sponge colonies went from 2-3 to 10-15) as well as an evaluative statement with supporting evidence (if collected properly, the evidence supports the theory).

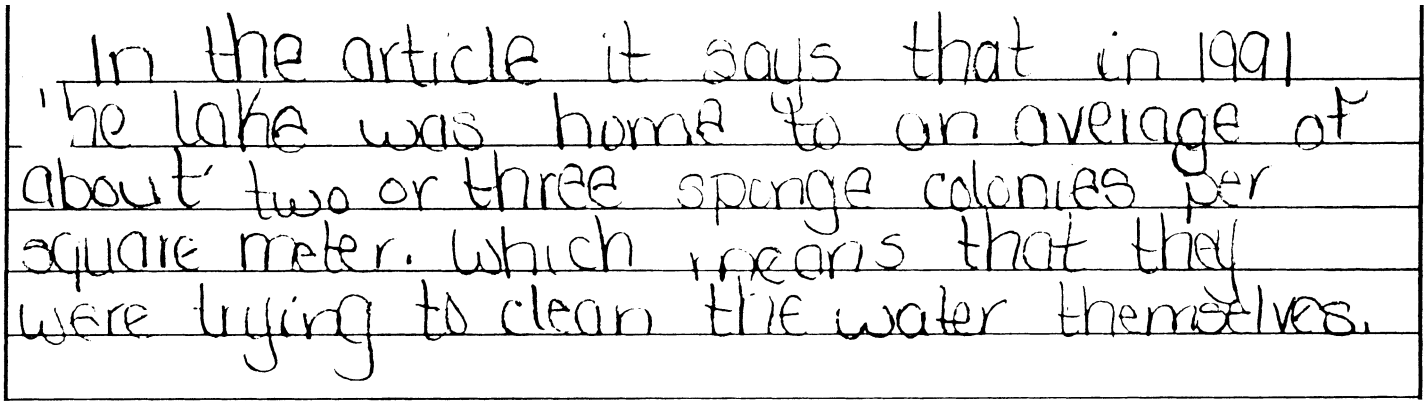
Question 16

They said that the sponges kill the mussels, which is good. They also say that the sponges are not harmful in any way, I really don't believe that they have any hard evidence. They can't exactly prove any of this, w/o major research.

Score Point: 1

Although this response fails to give any valid evidence to support the author's view, it does contain an evaluative statement (I don't believe they have any hard evidence) with supporting evidence (they can't prove this without major research).

Question 16



Score Point: 0

The evidence given in this response (the sponges were trying to clean the water themselves) incorrectly refutes the prompt assertion.

Question 25

SCORE POINTS:

2 points = at least 2 correct sources circled with a clear justification.

or

at least 2 correct sources circled with a negative approach in justification which references sites X and Y.

1 point = 1 correct source circled with a clear justification.

or

at least 2 correct sources circled with a weak/no justification.

or

combination of correct and incorrect sources circled with an understanding of waterflow.

or

factory 1 circled with a clear justification.

0 points = 1 correct source circled with a weak/no justification.

or

incorrect sources circled with a weak/no justification.

or

combination of correct and incorrect sources circled with a weak/no justification.

or

factory 1 circled with a weak/no justification.

Notes: A negative approach in justification means that the response clearly indicates why the incorrect sources (city A, factory 3) are not circled and cannot be producers of pollutant K.
References to sites Z or X and Y indicate a clear understanding of waterflow (downstream or upstream).
A weak justification means that the response does not demonstrate an understanding of waterflow and/or does not understand the significance of the sites. A weak justification may reference sites Z and/or X and Y but remains vague (e.g. "around Z", "not near X or Y").

Question 25

Part A

City A (City B) (Farmland) Factory 1 (Factory 2) Factory 3 (Factory 4)

Part B City B may be a possible source because its location is after X and Y but before Z. The farmland could be a possible source for the same reason. Something that was used on the crops may have gotten in the lake and flowed towards location Z. factories 2 and 4 could have been sources because they are after X and Y where pollutant K was not found and before location Z. They could have put something in the water and since it flowed towards location Z the pollutant could have come from them. City A and factory 3 are not likely sources because they are situated before locations X and Y, where pollutant K was not found. factory 1 could not have been a source because it is placed after location Z at which pollutant K was found. This could not be possible because the river flows in the opposite way of location Z for factory 1 to be a problem.

Score Point: 2

In this response, more than 2 correct sources are circled, and this very thorough justification leaves no stone unturned. Sites X,Y, and Z are referenced to indicate the locations of cities and factories. In addition, the response clearly indicates waterflow in both upstream and downstream directions. It justifies each source individually, including factory 1 (which may or may not be a source for pollutant K). This response would have earned 2 points with only a third of the information it provides.

Question 25

Part A

City A City B Farmland Factory 1 Factory 2 Factory 3 Factory 4

Part B Both a factory and a city are located upstream from locations X and Y. The only thing different about location Z is that the farmland is upstream. By process of elimination it's the farmland.

Score Point: 1

In this response, 1 correct source is circled, and it provides a clear justification which references sites X, Y, and Z. In this way, it indicates an understanding of waterflow, both upstream and downstream.

Question 25

Part A

City A City B Farmland (Factory 1) Factory 2 Factory 3 Factory 4

Part B Because the factory may be dealing with potent chemicals and pollute the water. The factory could be just throwing the chemicals in the water not knowing what it might do.

Score Point: 0

In this response, factory 1 is circled, although it may or may not be a source for pollutant K. The justification remains weak since it provides only general information.